



## **Discover Economics - How to run an outreach event**

### **Ideas from University of Bristol, University of East Anglia, University of Greenwich**

#### **1. Why?**

Reaching out to school and college students to encourage them to think about studying economics is hugely important. There is a serious lack of diversity among economics undergraduate students. Private school students are heavily over-represented in economics compared to other subjects and fewer than 30% of economics' students are women, lower than the share in maths and stats. While STEM subjects have made strides to attract women, economics is falling behind. There are many reasons for this lack of diversity, but there are several likely factors that outreach can help to address.

First, economics is not taught in all schools and colleges- and is less likely to be taught in the state sector than it is the private sector - meaning that many students may not even think about choosing to study economics at university. Talking about economics to students who may not have the option of studying it at school or college is important.

Second, the perception of economics among 15-17 year olds is often quite narrow. Economics is usually seen as being a subject about money and finance; and/or seen as indistinguishable from business or management. Economists also get a fairly bad press, a typical description of an economist is a "boring man in a suit, crunching numbers". It is important to present a broader, more diverse image of economics, showcasing its real-world relevance to major social and economic issues, and to present relatable and attractive role models.

#### **2. Who?**

##### **2.1 Students**

You will need to think about who your target students are.

One time to influence students' decision-making is year 10/11 (GCSE level) before students choose their A-levels (first choices are typically made around November/ December in year 11). Alternatively, you could target year 12/13 students who will be deciding which subjects to apply for at university.

### **When to hold your event?**

Visits to schools (rather than asking school groups to come to you) can be organised any time throughout the year for year 12s. But for an event, some times of the year may work better:

#### **Autumn**

Year 11 students typically make their initial A level option choices in the Autumn (November) so this may be a good time when they are thinking about what subjects they want to study – and they might be persuaded to think about economics (if it is available at their school/ college) or maths.

#### **Summer**

June/ July (after school and national exams) is typically a time when schools organise work experience/ careers activities. Teacher feedback suggests that late June may work better than July.

The key thing is that schools typically require a lot of advance warning in order to make arrangements for bringing students to an event. The longer you give schools notice about your event, the better.

You may be concerned about being responsible for students under the age 18. Here are some considerations, but you should follow your own institutions policies for this area.

- You typically do not need to be DBS checked, so long as the students are accompanied by someone who is checked (almost certainly always the case if a teacher is present) and there are not times when those students are left in the sole care of institute staff. You should be clear that you are not taking responsibility for providing DBS checked staff to support access to the event.
- During any breaks, students may leave the venue; you should make it clear that teachers are responsible for the participants if this happens.
- If you are taking photos/video, then there should be an announcement at the beginning that allows students to opt out and signage should also be displayed (the RES can provide sample wording). Best practice is to get wider shots to get a feel of the event; if faces are recognisable, the photographer should get the names of those individuals that they have given permission for the photograph to be used.

If you run an event for year 12/13, you may find that you mainly attract students who are already studying economics at A level. It is important to highlight that your event is also suitable for students who are studying other subjects at A level, including maths, social science subjects or business, and also for students studying e.g. BTEC Business or Business and Finance at Further Education Colleges.

Another thing to think about is whether to run an event for all students or to target a particular under-represented group (e.g. all state school students, women or BAME students). UEA decided to run an outreach event for year 10 girls, inspired by a similar science event, 'Women of the Future'. The aim was to target students as they are about to choose their A-level subjects to encourage them to take subjects which would allow them to study economics later. The event was designed to challenge the perception that economics is only about finance or business by inviting speakers from a range of fields, including health economics and behavioural economics to showcase the wide variety of options.

## **2.2 Teachers**

Economics teachers are an obvious group to advertise the event to but, because economics isn't taught in all schools, may not be enough in terms of reaching target student groups. Maths teachers, heads of sixth form and careers advisers are other options.

Encouraging teachers to bring students to the event can be challenging. Many universities have central widening participation teams who may have contacts and help with advertising and promotion. You may find that the event will grow in participation with each year that you run the event. At Bristol, we started with 35 students in the first year and now have 200+. You may want to allow for a drop out in attendees as sometimes teachers are called away at the last minute and then teacher/pupil or student ratios do not balance. It may help to offer funding to cover transport costs. At Bristol we have offered funding in each year but have never had any school take up the offer. Often, time out of curriculum is the biggest "cost" that teachers have to consider.

Many teachers will accompany their students and it is worth thinking about organising an activity for the teachers so that they get something out of the day. Where these sessions have been organised, they have received extremely positive feedback from teachers who took part.

Bristol and Greenwich organised teacher discussions. At the Bristol event, teachers welcomed the chance to talk about developments in economics and some of the challenges they faced. At the Greenwich event, teachers welcomed the opportunity to share their experiences of pedagogy, and to contribute their ideas to on how to improve

the transition process for students from a range of academic trajectories (SFC A-level economics/maths, SFC non-'target' A-levels, BTEC, IB).

At the UEA event, teachers were offered a CPD-accredited session with two elements. The first was a discussion about the "life-cycle" of a university economics student: from entry-level subjects to leavers' destinations as well as pedagogical approach to teaching economics at university. The second was a discussion about how to develop student confidence and academic self-efficacy through pedagogies that combine peer-instruction and self-assessment. All examples and demonstrations were given in the context of teaching economics.

### **3. What?**

What is delivered will depend on the target audience. In general, outreach events have involved a mix of talks, games, panel discussions and interactive challenges. Older students (year 12) can handle more talks and discussions. Younger audiences benefit more from games and tasters. In general, making sessions interactive is a good idea, particularly during a day-long event. The feedback on interactive activities is typically very positive.

**"I really enjoyed the discussions and talks from professional economists and it was great that we all got to participate and get involved via the games and competition"**

#### **Practical tips**

Make sure there are enough breaks. Feedback from students is that one break in a morning or afternoon session is not enough. And provide drinks.

Choose topics for discussion that students can relate to.

If you have student ambassadors, make sure that they come from diverse backgrounds to provide role models that the younger students can relate to. Some students' understanding of what it is like to attend and study at university is very limited, especially if they are first in family to attend.

### 3.1 Talks/ panel discussion

Having economists talk about their work is a good way to illustrate the range of different things that economists do (not just working in finance). The Bank of England and Government Economic Service run ambassador programmes and can provide speakers (and are usually willing to cover their own travel expenses). Some examples of talks:

- Helen Miller (IFS) on whether the rich pay their fair share of taxes
- Malindi Myers (Bank of England) on her experience of working at the Bank of England and previously in the GES
- Sarah Reis (Women's Budget Group) on government spending and how it might affect men and women differently
- Nishan Ashmut (Bank of England) on the aftermath of the financial crisis

Many outreach events have featured a panel of economists talking about their current jobs and careers. Getting alumni who work as economists – or have gone into other careers – can be good to illustrate what you get from an economics degree. Most people who study economics don't go on to work in economics, but may still feel that they have benefitted from the analytical and quantitative skills that they have gained from studying economics (as well as being able to talk about what it's like to study economics).

Students may not be willing to ask questions directly to a panel. At UEA they submitted written questions in advance. You could also think about using interactive apps such as sli.do to get questions/ poll the audience.

**“I enjoyed the economist panel as it allowed me to understand what an economist does, and I found it very interesting how people got to that job and which parts they personally enjoy”**

**“Enjoyed understanding how many different "types" of economists there are, made me really think seriously about doing it in uni”**

### 3.2 Games

There are a lot of [classroom games](#) that can be used to illustrate economics concepts.

- Games often work well at the beginning of an event. Something like the auction game is lively and fast paced and gets everyone involved straight away.
- It helps motivation if you have a small, token reward for the winning team.
- It's useful to engage student ambassadors to help run the games, e.g. in the auction game they can help to keep track of the auction, particularly the numbers of the teams who win each lot.

## Games

University of Bristol has run the **AUCTION GAME** in which students work in teams to buy enough ingredients at auction in order to be able to sell set menus in their restaurants. This is a fast-paced game which requires minimal set up and resources. The game can be adapted to work for groups of any size from 30 to 300+. It requires print outs of instructions packs and A3 printed placard for each team. Examples of these are given at the end.

### How does the game work?

Students are split into teams and given the information pack containing details on the set menus for their restaurants, their budget and an explanation of the auction process they'll need to take part in in order to buy the ingredients required for their menus. Once teams are ready, the auction begins and for the remainder of the game teams bid against each other for the ingredients. Teams need to keep track of what they have bought and how much they have spent so that they don't go bankrupt. At the end of the auction, teams work out which menus they can offer given the ingredients they have bought and how much money they have spent in total. Finally, they calculate their total profit and the team which makes the most money is the winner! The whole game takes about an hour.

There are a number of versions of this [game available](#). When there are large numbers it can be difficult to run a traditional English auction because students may be shy or slow to react. For events with 100+ students it can be better to use a Japanese (ascending clock) auction. Each team's bidder is asked to stand at the beginning of the auction and the auctioneer then starts announcing ever-increasing prices for the lot. When the price is too high for the team, the team's bidder simply sits down. The lot is won by the last bidder standing. This means all teams are engaged from the beginning of each lot and they don't need to have the confidence to shout out. To keep the game moving quickly, you may want to stop the bidding whenever there are 3-6 bidders left standing (instead of only one).

Some parts of the game require a lot of planning and calculation. With large student numbers you may want to provide more information in the instruction pack so that teams can be largely self-reliant. Projecting a spreadsheet of the auction showing the content of the current lot and winners of the previous lot can also help teams to keep track of what's going on.

UEA ran **the PRODUCTION LINE GAME**, in which increasing numbers of student workers are added to a simple production line to demonstrate diminishing marginal returns. The game requires two containers and approx. 25-30 tennis balls (or something else) that can be moved from one container to another. You may also want to hand out flip chart paper so that students not working on the production line can keep track of progress.

### **How does the game work?**

The two containers (one filled with balls, one empty) are placed around two metres apart. The task is to move as many balls as possible, one ball at a time, from one box to another within a specified time (one minute or 30 seconds – a volunteer can keep time).

The game starts with one student worker on the production line; the number of balls moved from one container to another is recorded. If a ball is dropped it is lost. In round two, an additional person is added to the ‘production line’. The task is the same, i.e. moving balls from one container to the other, one ball at a time, with the balls passing through the hands of both workers. The number of balls moved from one container to another is again recorded. The game is repeated, adding an additional worker each time..... up to six or seven people.

Since the distance between the containers stays the same, the space to move becomes more limited and there are likely to be diminishing returns to adding more workers (and at some point possibly even negative returns); keeping the production technology fixed, i.e. the distance between the boxes, the size of the boxes and the size of the balls, an additional worker ‘gets in the way’ of the other worker and does not necessarily increase production.

The game can be run with the production line taking place at the front. In this case, students who are not “workers” can be involved in recording the data in a table and producing graphs showing total productivity as the number of workers increases and, depending on their age, average productivity and marginal productivity. It would also be possible to run the game with multiple production lines. In total, the game took about 45 mins to run and discuss.

Bristol has run an interactive **DEVELOPED/DEVELOPING COUNTRY** session in which students had to identify countries as developed or developing based on (different) information that they received. The task was set up as a ‘real-life’ request from a colleague at the UN. The session can be run in a lecture style-setting and works for

promoting thought and discussion in large groups. It was run for a group of c. 70 year 10 students but could easily adapted to suit students at any age from 11-18+.

### **How does the game work?**

Students are shown a stylised email from a colleague at the UN which asks the recipient to quickly identify, from a list of 10-15 countries which are developing countries and which are developed. For example, the list might include the USA, Russia, Peru, South Africa etc. Without any further information, students are asked to select all the countries which they think are developing countries. Responses are collected either by clickers/polling or audience response software and a graph of the results (showing how many people chose each country) are then displayed on screen. The lecturer can then discuss the results and the need for more information before coming to a conclusion. The exercise is then repeated, each time giving students a new piece of data to sort the countries by. For example, you might first give them average income then life expectancy, corruption etc. Typically, the countries would be ranked differently according to each piece of data and this would be reflected in students' responses. This then allows discussion of how difficult it is to separate countries into crude categories like this and that either more or different categories are required to group countries today. This can be followed up by showing some of the dynamic graphs of countries over time on Gapminder.

The session works well because it builds on concepts students are likely to be familiar with from Geography at school, whilst showing them some of the difficulties of working with data. For school students, particularly those under 16, the session works best when clickers (rather than polling software on their phones) are used, as there is no need for them to have a phone and there are no difficulties surrounding internet access or logging in.

### **3.3 Schools challenge**

Bristol has run a challenge (also referred to as "apprentice economist") as part of its year 11/12 outreach event for several years. The idea is to showcase the type of issues that economists look at by getting students to apply some basic economic thinking to real-world challenges – for example, encouraging healthy eating in schools, cutting congestion, dealing with the issues raised by automation, the gender pay gap.

The students work in groups of typically between 5-8 students. When we started, we did this with about 35 students in 6 groups; at the most recent event we had about 200 students in nearly 30 groups. The challenge the students are given is to prepare a summary

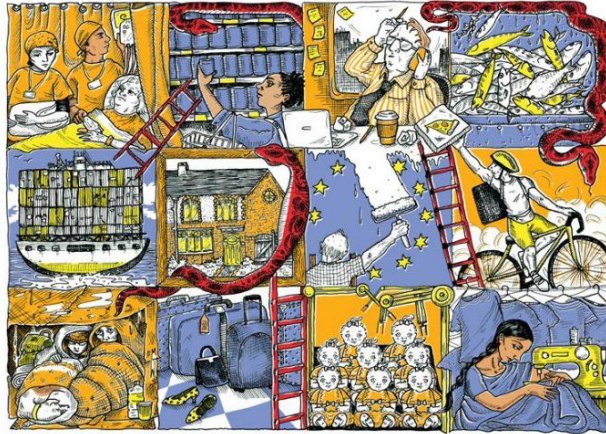


of what they think the issues are and their policy recommendation(s). Initially each group prepared a short presentation, strictly timed at 2 minutes. However, with a larger number of groups, it was no longer possible for everyone to present in the time available and we changed the output to a one-page poster. Students are provided with flip-chart paper and marker pens. Initially, we were able to give each group a table to work on – again with larger numbers, this was no longer possible, but the students were happy to find themselves a place and worked happily around the paper on the floor.

The challenge takes about two hours to run. The session starts with a short, 15-minute or so, briefing on the issue. Where relevant this briefing has emphasized both standard economic concepts and ideas from behavioural economics. For example, students are told that to encourage healthy eating, economists might think about using standard economic incentives that change prices and/or information interventions and/or behavioural nudges. Students are also provided with a pack that explains the challenge and contains some written materials (there is an example of the written brief below; one way to improve this might be to provide more explicit suggestions on how to prepare a poster). Groups are then given an hour to work on the issue, discuss the ideas and work on their presentation/poster – while they are doing this, we go around the groups and talk to the students about their ideas. The remaining time is spent providing feedback – while the posters are judged – and on announcing the winners and giving prizes (typically books for the members of the winning group)! We also encouraged students to go and look at each others' posters. Students seem to like the competition element – the criteria used to judge have focused on economic thinking, creativity in terms of the policy ideas and the quality of the presentation. It has often been hard to pick out a single winning group and have often had joint winners. We have also asked the judges to comment generally on the things that they liked generally about the presentations/ posters.

**“I enjoyed the afternoon activity and how the judges/economists came round to our groups to discuss our ideas”**

From the first year we ran the challenge – which focused on how to encourage charitable giving in the workplace – it has been really encouraging to see how much students have engaged with the topics. There is usually a lot of very lively discussion as students prepare their presentations/ posters and some really interesting policy ideas emerging.



**Discover Economics**

## **Food Fight**



**The Auction Game**

## The Auction Game - Setup

Students need to be split into teams of a maximum of 6 per team. With 250 students we would have roughly 45-50 teams. It may be easier to split them into teams before the day. If this is not possible, teachers could split the students into groups on the day of the event. In our case the students were coming from schools in teams of 10-20, so we just had the schools split themselves up into teams.

If you are interested in getting students to meet and work with students from other schools you can organise them randomly. We found that the best way to organise this on the day is to give each student a number between 1-50 and then have students match with other students with the same number. You can give this to them when they arrive, either on a name tag or on any other material. To make it easier for students to organise themselves for the game, you should have them sit roughly according to their number.

Each student or each team should be given an instructions packet (see below), an accounting sheet to keep track of lots won, and a profit calculation sheet. Each team should be given a large placard with their team number written large enough so that the auctioneer can see it from the front of the room.

Each team will organise itself into roles:

- a) Planners – The entire group should work together to determine a strategy for bidding and for producing meals.
- b) Bidder – One person will be responsible for holding the placard and managing the bidding process. You may want to choose the tallest person in the group for this role.
- c) Producer – One person will be responsible for taking the raw materials and organising them into the three different menus listed below.
- d) Accountant – One person will be responsible for calculating profits.
- e) Support – Other members of the group will support the bidder, producer and accountant in their roles. Support workers will also be responsible for making sure that the bidding and producing that occurs during the game follows the strategy set out by the group at the beginning of the game.

Once the students are in teams we introduce the game and the rules of play and they are given time to read the instructions and develop their strategy. Then you will run the auction. This will be run as a Japanese style auction. It is a silent auction where the teams will hold up their placards while the auctioneer gradually announces higher and higher values. If an announced value is greater than a team's bid, they will lower their placard. Once there are only 5-10 placards remaining standing, the round ends and the remaining teams win at the final value announced. You need 30 minutes to run the

auction.

Following the auction, the students will be given some time to finalize their play and to calculate their profits. You will then collect each team's profit sheet and double check everything versus the auction's results. The winning team and the runner ups will be announced later in the day.

If there is time at the end of the game, you can spend a few minutes discussing the game and its connection to some economic concepts. Otherwise you could do this later when the winners are announced.

### **Logistics and material:**

Here are what you will need at a minimum:

- At least 5, but hopefully 6 people to help run the auction. In the first stage, the helpers will walk around and answer any questions the students have about the game. When the auction starts, the helpers will keep track of bidders and teams that win the lots for each round. One person will be filling an excel sheet, one or two people will help by keeping track of the numbers of the winning teams, the rest of the helpers will be walking around and helping.
- Packets: The instructions for the game, an accountant sheet to keep track of lots won, and a profit calculation sheet. You can either give one of these to each team or have a packet for each student. The instructions sheet is attached below. This can remain the same, except that you will need to edit the first page. There is also an accountant sheet and profit calculation sheet.
- Placards: Large (A5 or bigger) placard with the team number written in large enough font so that the numbers can be seen over the crowd and from the front of the room.

## The Auction Game – Instructions for Students

You are the owners of a restaurant, and you can select to offer any combination of the menus listed below. Due to price competition from other restaurants, you will only be able to sell each meal for the given price, but you will be able to sell all meals that you offer. You need to obtain the raw materials for these meals in a competitive market, and the raw materials will be offered at auction to the highest bidder. Any raw material(s) that you obtain which cannot be used in these menus in the specified proportions will be regarded as waste and thus cut into your profits. It is your goal to obtain the food you need to offer those meals which will result in the maximum profit for your restaurant.

The structure of the game is as follows:

1. Examine the structure of the menu(s) and determine which menu(s) you will offer.
2. Purchase the food (i.e. the raw materials) you need to offer the menu(s) you have chosen. The food will be offered at auction, and you will be bidding against other restaurants. Each type of food will be offered several times during the auction. **You have a budget of £2,500.** If you purchase £2,500 worth of food, you have run out of money, and you must stop bidding.
3. After the auction is closed, use the food you have purchased to construct the combination of meals that will make you the most money. You can sell all complete meals at the price indicated. Meals may come from more than one of the menus. Food that cannot be used in preparing a meal is considered waste. Waste food cannot be resold or transferred to another restaurant.
4. Calculate the value of the meals that you sold in Step 3. Add any of the original £2,500 that you did not spend to purchase food. Subtract the original £2,500 to calculate your total profit. The restaurant with the highest total profit wins.

## ***THE COST***

***£10***

Entrée:

- (1) Meat
- (1) Vegetable
- (1) Pasta

Beverage:

- (1) Beverage

## ***THE GOURMET***

***£20***

Salad:

- (1) Vegetable

Entrée:

- (1) Meat
- (1) Vegetable
- (1) Pasta

Dessert:

- (1) Sweet

Beverage:

- (1) Beverage

## ***THE BULL***

***£30***

Salad:

- (1) Vegetable

Entrée:

- (2) Meat
- (1) Vegetable
- (1) Pasta

Dessert:

- (1) Sweet
- (1) Fruit

Beverage:

- (1) Beverage

## Producer's sheet

- a) Total purchases – At the end of the auction write down the quantity purchased for each ingredient.

Quantity of Meat	Quantity of Vegetable	Quantity of Pasta	Quantity of Beverage	Quantity of Sweet

- b) Menu decision

- Use this table to confirm your decision over the number of each menu you will sell. Put this number in the yellow box.
- Confirm you have enough ingredients. For each menu type calculate how much you will need of each ingredient (pink boxes).
- Use the blue boxes to calculate the total amount of each ingredient you will need for all the menus you sell (blue boxes). Confirm that these numbers are NOT bigger than the numbers you have bought and recorded in a) above.

Menu Type	Quantity sold	QUANTITY OF INGREDIENT REQUIRED					Menu Price	REVENUE PER MENU = Quantity sold x Menu Price (yellow box x green box)
		Meat	Vegetable	Pasta	Beverage	Sweet		
THE COST							£10	
THE GOURMET							£20	
THE BULL							£30	
	TOTALS:							

## Accountant's sheet

### PART 1 - Auction purchases

Your accountant(s) should use this sheet to keep track of money during the auction.

Remember that you start off with a budget of £2500. At the end of the auction use this to help the producer confirm which menus you have to sell.

Lot	Ingredient	Quantity	Price Paid	Money Remaining
				<b>£2500</b>
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				



## PART 2 – Profit calculation

### TOTAL REVENUE

Use the orange boxes on the producer's sheet to calculate this. Add together the numbers in the three orange boxes to get the revenue you make on each menu type that you sell.

*Total Revenue = (Quantity of 'The Cost' sold x £10) + (Quantity of 'The Gourmet' sold x £20) + (Quantity of 'The Bull' sold x £30)*

### MONEY REMAINING

If you had any money left from the £2500 which you DID NOT spend at auction, record this amount here.

### TOTAL COSTS

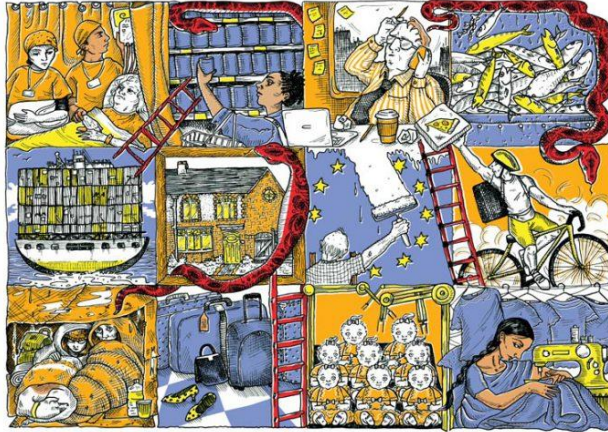
This is the amount of money you spent IN TOTAL at the auction + Money remaining. This will be £2,500 for every group.

### TOTAL PROFIT

Now calculate your total profit:

Total Profit = Total Revenue + Money Remaining - Total Costs

	+	
	-	
£2,500	=	



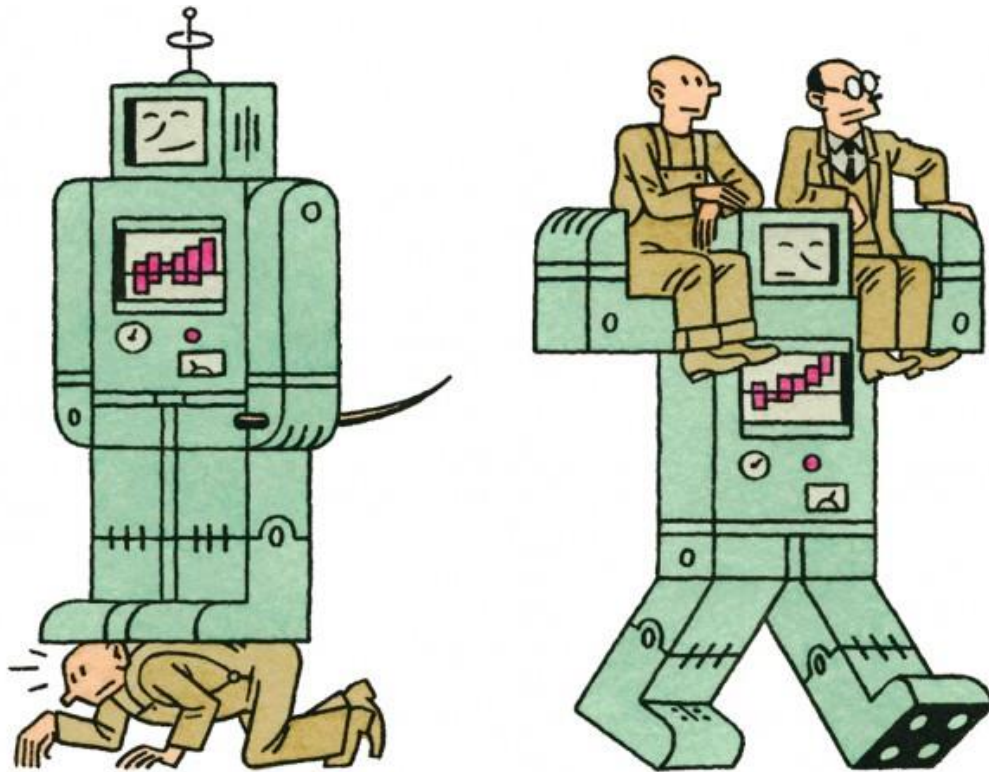
## Schools Challenge

### The Robot Invasion

Robots are invading the UK. Ok, not exactly, but with the advent of artificial intelligence and innovation in robotics, robots are likely to take on a bigger role in the country's economy. Whether it is the self-service checkout at the supermarket or automated accounting software, established careers and jobs that used to be performed by humans, are now being automated or performed by robots.

The Government wants some economic advice on how to deal with the challenges and opportunities that arise with this trend towards greater automation.

Your task is to prepare a poster board with your policy advice.



## The problem

Technological change and the advancement of artificial intelligence present a great number of opportunities and challenges for economies across the world, including right here in Bristol. Many of us experience directly the benefits of technological change. It generally improves the quality of consumer products as well as making them more affordable.

Examples of artificial intelligence at work around us include:

1. Self-service checkouts at the supermarket
2. Robotic production and car manufacturing
3. Automated accounting software
4. Drone delivery
5. Driverless cars

We are able to harness technology to get better access to information and to improve our day-to-day lives. Equally, this rapid pace of technological change can cause big shifts in the balance of power in society and our role within the economy.

1. Taxi and delivery drivers replaced by drones and driverless cars
2. Accountants and lawyers replaced by software
3. Cashiers replaced by self-service checkout

As with any time of significant change, there are those that stand to benefit from the shifts

brought on by technology and those that face the possibility of being left out of this new more automated economy.

The UK Government is responsible for the whole population, and so has to face the challenges of those negatively impacted by these changes, as well as to make sure to foster and develop the benefits they present. Civil servants have identified the following set of opportunities and challenges that come with the rise of the robots.

Opportunities

Challenges

Creation of new jobs

Loss of old jobs

Cheaper/better goods and services

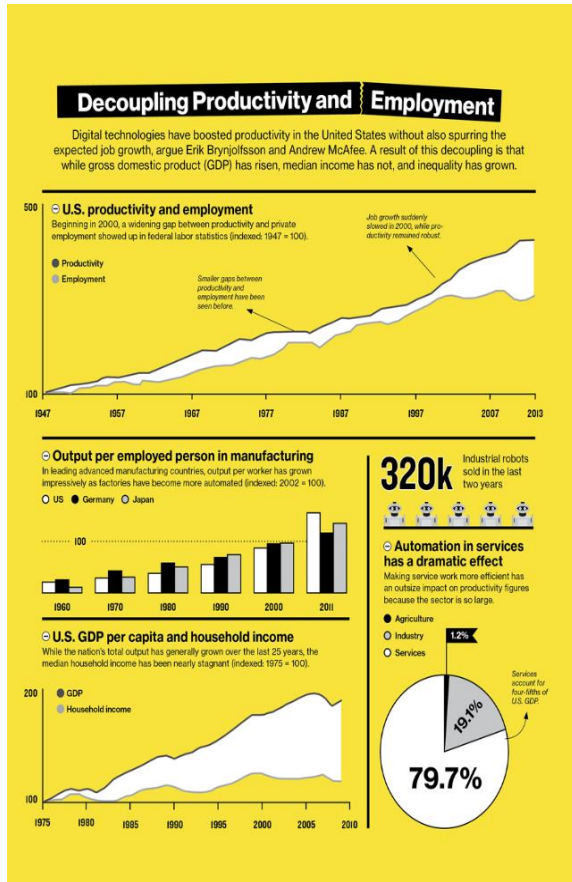
Concentration of wealth (who owns the robots?)

Greater Profits for firms

Greater need for government provided benefits

Can you think of any other benefits or challenges?

Civil servants have also presented the following challenges from an increased reliance on robots. This is based on a research report on the United States economy from the Massachusetts Institute of Technology (source: MIT Technology Review). Similar trends are generally observed in Europe and the UK.

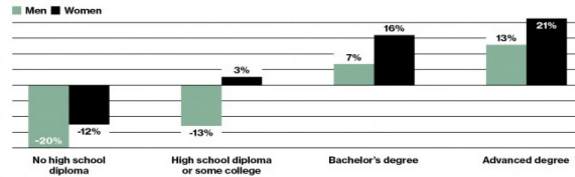


## Disappearing Jobs

Automation and digital technology have replaced many jobs involving repetitive tasks in manufacturing and office work. The remaining jobs often require increasingly advanced skills.

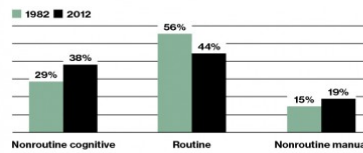
### U.S. Median Real Earnings by Education Level, 1993-2013

Wages for men with a high school diploma have dropped as the number of production jobs has decreased and more men have taken low-paying jobs in food services, cleaning, and groundskeeping.



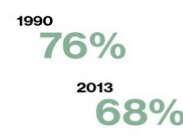
### Share of U.S. Employment by Type of Occupation

Jobs are considered routine when they involve specific, repetitive tasks. These are the easiest jobs to automate.



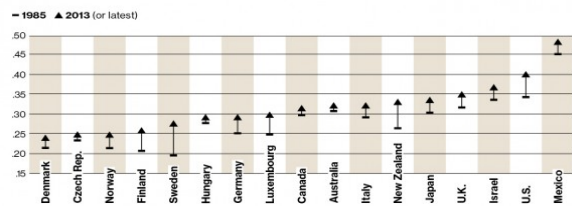
### Who's Working?

Fewer American men with high school diplomas or some college are employed full time.



### Levels of Income Inequality in OECD Countries

Inequality as measured by the Gini coefficient, reflecting income distribution; 1.0 would be maximal inequality.



MIT Technology Review

Some UK companies have heard that the Government is looking to address this issue and have compiled some information on the benefits of automation and technological innovation (source: Accenture):

## Robotics drives efficiency benefits, along with improvements in quality, scalability and resiliency in a cost-effective way



Human	Robot
Wants paid holidays & weekends	Can work 365 days a year
Wants a wage, bonuses	Works for free
Can only work about 8 hours a day	Can work 24/7
Falls ill, negatively impacting productivity	Predictable availability
Has high expectations of his employer	No expectations whatsoever
A lot of administration	No administration whatsoever
Significant management (performance reviews, team meetings...)	Maintenance only
Quality fluctuations	Predictable and constant quality
Significant extra costs (company car, insurance, labor taxes)	Little extra costs

The Government would like to get this right. The future of our economy depends on being able to harness the power of technology in order to improve the lives of the population as a whole. Taking the wrong actions might hurt the development of future technology and make life more difficult for businesses in the country and for the average British citizen. Doing nothing may lead to an increase in inequality and cause many hard-working citizens to lose their jobs and careers. Faced with this herculean task, the Government has turned to you for advice...the future of the country is in your hands!

### Possible solutions

As you develop your proposals, keep in mind that the power of the government is limited and constrained. Your proposals should be based on realistic actions within the scope of a national government. Some of the tools available to the Government are presented here. Feel free to propose your own solutions.

1. **Taxation** – the government could introduce a tax on robots; but how would this be realised, and what would be the benefits?
2. **Education/training** – more education could be available for workers, but why would this be important, and how would it be funded?
3. **Government investment** – could the government provide investment in artificial intelligence and robotics, in such a way that it creates benefits for the whole of society? How?

**Of course, there are many other possible solutions. It is your task to develop the best idea, and present it in the form of a poster.**